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Abstract

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Keywords: humor, hospital clown, nurse, transcendence, amusement

Positive Emotions Elicited by Clowns and Nurses: An Experimental Study in a Hospital Setting

Hospital clown interventions (also referred to as clown therapy, medical clowning, humor therapy, clown visits) have been established in care facilities for many years, aiming at cultivating positive feelings in individuals in a particularly adverse environment such as hospitals or rehabilitation centers (Dionigi, Flangini, & Gremigni, 2012). Although clown interventions are a natural home for psychological humor research, only few empirical studies have attended to such humorous interventions (for an overview see Auerbach, Hofmann, Platt, & Ruch, 2014), none of which have experimentally investigated the direct and immediate effects of these interventions on the emotional state of patients.

The existing literature on hospital clown interventions is reduced to experience reports of clowns working in hospitals (e.g., Adams, 2002; Dionigi et al., 2012), qualitative studies interviewing clowns, hospital staff and patients (Linge, 2013), and very few experiments aiming at a systematic empirical investigation of the effects of such interventions on patients (without highlighting changes in emotional states in detail). The former two sources of information (experience reports and qualitative studies) describe a variety of emotions emerging during such interventions including amusement and emotional states transcending the typical humor response. For instance, one of the pioneers in the field, Patch Adams (2002) characterizes the work of hospital clowns as *love-strategy* formed by the combination of *humor* (bringing fun to people and making people laugh) and *love* (treating patients with compassion and generosity, getting close to patients). In his view, it is essential that patients experience joy, fun, being cared for and loved, which results in better health for the patient as well as hospital staff. Linge (2013) concludes that hospital clowns apply a mixed method of humor and empathy and thereby elicit surprise, joy, acknowledgement, appreciation, and a close connection to the clown (*magical attachment*) in children and adolescents. The third

source (quantitative studies using an experimental design) compares clown-induced changes such as unspecific positive affect (feeling happy) and the reduction of worries (e.g., Costa Fernandes & Arriaga, 2010), agitation (Low et al., 2013), or changes in physical conditions such as electrodermal activity, and blood volume pulse (Kingsnorth, Blain, & Keever, 2010) to control groups without intervention. However, nothing much can be said about the effects on positive emotions. Studies either do not allow attributing the found effects explicitly to the hospital clown intervention as they lack sufficient standardization during the interventions, or no comparison interventions are established and thus no effects can be compared. In case comparison groups are established, studies demonstrated a reduction of negative emotions (e.g., children's preoperative anxiety; Vagnoli, Caprilli & Messeri, 2010), but did not look at the positive emotional state of subjects. In summary, these studies fail to highlight the psychological mechanisms that lead to the observed changes in physical or mental conditions in patients. Therefore it is the first aim of the present research to investigate which emotional states are elicited in patients during a hospital clown intervention in comparison to a different kind of intervention using a controlled experimental design in a natural hospital setting. A nurse assessment will be chosen for comparison, because a nurse is also attentive and caring, but has no explicit humorous mission. This allows for studying whether hospital clowns add a unique component to the hospital, thus making them irreplaceable and giving scientific support for a legitimation of clown visits to practitioners, especially policy makers in care facilities.

Nature of emotional states during clown interventions

According to Adams' (2002) *love-strategy*, a hospital clown intervention contains two aspects: humor and love. The emotional reactions of individuals to humor have been studied widely in humor research. Ruch (2009) describes the affective response to humorous stimuli

as amusement (or *exhilaration*[1]). Amusement is displayed on a behavioral (e.g., smiling and laughter), physiological (e.g., changes in heart rate and skin conductance) and experiential level (e.g., changes in emotional state and frame of mind). Being a humorous stimulus, hospital clowns are expected to elicit exhilaration (or amusement) in individuals, which involves measurable changes in the subjective level of felt amusement.

The love-aspect, that is, the nature of emotional states elicited in patients when interacting with a "loving" clown, has been described in qualitative studies, which give examples of facets of positive emotions transcending the humor response (e.g., feeling attached to the clown; Linge, 2013). The first quantitative study investigating the love-aspect showed that subjects watching films of hospital clown-patient interactions reported a higher level of *transcendence* compared to nurse-patient interactions and circus clown performances. The authors define transcendence as the feeling of being uplifted and surpassing the ordinary, for example feeling elevated, privileged, appreciated by and associated with the clown (Auerbach et al., 2014). The study showed that in order to measure changes in emotional states according to hospital clown interventions, general mood scales are only of limited help as they are not specific to clowning and they neither capture humor-related changes in emotional states nor changes transcending amusement. The *29 Clown Emotion List* (CLEM-29, Auerbach et al., 2014) was developed to close the gap in research. It consists of 29 single ratings of emotional states, which can be reduced to the four factors of *amusement* (e.g., hilarity, playful), *transcendence* (e.g., elevated, appreciated), high (e.g., overexcited) vs. low (e.g., speechless) *arousal*, and *uneasiness* during clown interventions (e.g., fearful, threatened). However, the research was conducted with observers of the interventions, which leaves the question open whether the results can be translated into the natural hospital setting with patients being actively involved in the intervention.

[1] The term *exhilaration* is derived from its Latin root (hilaris = cheerful) to denote either the process of making cheerful or the temporary rise in cheerful state (Ruch, Köhler, & van Thriel, 1997).

Possible roles during a hospital clown intervention

In a typical hospital clown intervention there is often more than one person present: sometimes one patient is the focus of attention, while others are standing by and are merely observing without necessarily being engaged (e.g. parents), other times other individuals are being involved by the clowns (e.g. other patients) or are working together with the clowns (e.g., hospital staff; see also Dionigi et al., 2012; Low et al., 2013). Linge (2013) reported that both observing staff and children involved in clown interventions reported the occurrence of the same feelings of joy and acknowledgement. Two conflicting mechanisms need to be taken into account when hypothesizing about the emotional states in individuals sharing the same social environment (a hospital clown intervention) while being in different roles: Effects of *emotional contagion* and effects of experiencing *other-praising emotions*. Hatfield, Cacioppo and Rapson (1994, p. 5) define emotional contagion as '[…] tendency to automatically mimic and synchronize expressions, vocalizations, postures, and movements with those of another person and, consequently, to converge emotionally'. Emotional contagion during a hospital clown intervention could mean that the participating subject would infect the observer(s) with their emotional state. In contrast, Algoe and Haidt (2009) subsume the emotions of elevation, gratitude and admiration under other-praising emotions, which were elicited explicitly in observers who witnessed an act of moral virtue or beauty such as charity or generosity, and differed in physiological experiences and action tendencies from emotions elicited when watching funny films (e.g., amusement). Given that a clown doing beneficial work in a hospital can be viewed as an act of moral beauty, it could be argued that observers experience different emotions than participants of clown interventions. For example, being involved in the clowns' jokes and tricks might result in feelings of amusement and playfulness, whereas observing it might result in a feeling of elevation, touch, or gratitude (and thus transcending the humor response). To shed light on the issue, the

second aim of the present research is to investigate the difference in emotions between a participating and an observing patient during a hospital clown intervention.

Aims and hypotheses

Firstly, the present study compares the baseline emotional state of hospitalized patients with emotional reactions during a hospital clown intervention and a non-humorous control intervention (a typical nurse assessment). Ruch (2009) described the emotion of exhilaration (elicited by a humorous stimulus) as pleasurable, relaxed excitation. Hence, the hospital clown intervention is hypothesized to lead to higher feelings of amusement and arousal than the nurse intervention and baseline assessment. Compared to baseline, it is expected that both interventions raise the level of transcendent feelings as they subsume feelings occurring in a situation where the patient is the focus of attention (e.g., appreciation, association with the interacting partner). However, the clown intervention is expected to exceed the nurse intervention in the level of induced feelings of transcendence (as shown in Auerbach et al., 2014). Basically, neither the nurse nor clown intervention is expected to elicit feelings of uneasiness. However, as some individuals fear clowns, and associate nurses with both pain and relief, the level of uneasiness will be studied here, too.

Secondly, the study investigates whether the emotional states of patients differ as a function of their role during the two interventions. In terms of amusement (which has a highly contagious effect, e.g., Wild, Erb, & Bartels, 2001), no difference between participating and observing patients in either intervention is expected. As amusement is an aroused emotion, we also expect no difference in arousal between participant and observer. On the other hand, we assume that observers experience higher feelings of transcendence (as they observe an act of moral kindness) than participants. As none of the interventions are expected to elicit negative feelings in patients in general, also no difference between the roles are expected.

The study with observers (Auerbach et al., 2014) showed that a global positive judgment of clown interventions could best be predicted as a combination of both amusing and transcendent emotional states. To replicate and extend those results, the present study thirdly investigates whether the clown-specific emotional dimensions contribute to the prediction of a positive judgment of the hospital clown intervention, over and above a general preference for clown performances.

Method

Sample

The sample consisted of $N = 42$ German speaking patients from a physical rehabilitation center (81% male). Age ranged from 19 to 75 years ($M = 45.36$, $SD = 16.56$). Reasons for treatment were prior accidents resulting in paraplegia, amputations, or multiple injuries. Forty-two percent of patients had prior experience with hospital clown interventions, of which 40.5% had had more than one clown visit. Inclusion criteria were age 18 or older, voluntary participation, not bedridden, and being cognitively and physically able to participate in the study. The latter was decided based on the assessment of the psychologists and nurses working in the clinic, and on personal impressions of the two investigators (both psychologists) in conversations with the patients.

Instruments

The *29 Clown Emotion List* (CLEM-29; Auerbach et al., 2014) is a collection of 29 positive and negative adjectives and short phrases assessing the current emotional state in the context of clowning. All single items are rated on a 7-point Likert scale ranging from 1 (= ‘not at all’) to 7 (= ‘very strongly’). A factor analysis of the ratings produced four factors, three of which were unipolar (amusement, transcendence, uneasiness), and one was bipolar (all ratings of the bipolar factor relate to different states of arousal). The single ratings as well as the factors have been proven to be sensitive in capturing changes in clown-induced

emotional states. In an observer study, items related to transcendence predicted a general positive evaluation of clown interventions over and above feelings of amusement.

The state version of the *State-Trait-Cheerfulness-Inventory* (STCI-S<30>; Ruch, Köhler, & van Thriel, 1997) is a widely used, reliable and valid 30-item state measure of the three dispositions for the induction of exhilaration, that is, cheerfulness, seriousness, and bad mood (Ruch & Hofmann, 2012). For the present experiment three items were used, each one best representing the corresponding scale ('I am cheerful', 'I am in a serious frame of mind', and 'I am in a bad mood'). The answer format is a 4-point Likert scale ranging from 1 (= 'strongly disagree') to 4 (= 'strongly agree').

The *Hospital Study Evaluation Form* (HSEF; Auerbach & Fehling, 2012) was created for use in the present study and consists of three sets of questions serving different functions. The first set (HSEF-General, eight items) was constructed to back up the cover story (to evaluate the hospital routine and work of hospital staff; see procedure) and was given to subjects at the beginning of the experiment. It contained general questions regarding the stay in the care facility (e.g., quality of meals, quality of care). The second set was used to collect information about subjects' perception of the experienced interventions (HSEF-Current, seven items) and was given after each intervention. It contained specific questions regarding the current interventions, the level of global positive and negative feelings during the situation, and the perceived role of subjects during the situation (participating or observing). The answer format for the HSEF-General and HSEF-Current is a 7-point Likert scale ranging from 1 to 7 (with different scale anchors depending on the type of question asked). The third set of questions (HSEF-Preferences, 15 items) concerned subjects' perception of general preferences for clowns and nurses, and was given to subjects at the end of the study. Items (e.g., 'How funny do you think the clown performance was'?) are rated on a 5-point Likert scale ranging from 1 (= 'not at all') to 5 (= 'very much').

Experimental design

The experimental design was a 3 (*conditions, within subjects variable*) x 2 (*role of subject, between subjects variable*) mixed factorial design. The three conditions were the baseline (no intervention), the humorous intervention and the non-humorous intervention. The order of the two interventions was randomly assigned for each trial with the help of a computer-based research randomizer. The role of subject consisted of either the role of the participant (actively involved in both interventions) or the role of the observer (in the same room as the participant, but not involved in the interventions). The role was also randomly assigned[2] and stayed constant throughout the experiment. Subjects were blind to the assignment of a role, and to the types of interventions conducted. The dependent variables were subjects' emotional states during and judgments of the two interventions, using the CLEM-29 dimensions, the STCI-S ratings, and the HSEF ratings.

Procedure

Prior to the study, the local ethics committee approved the study, and all participants gave their written consent to take part in the study. Patients were recruited in the rehabilitation center with the cover story to participate in a study evaluating the work routine and patient satisfaction in hospitals. They were informed about two non-invasive routine assessments carried out by members of hospital staff in the room, which they should evaluate afterwards. Subjects were neither informed that a nurse nor that a clown would participate in the study. The procedure was highly standardized. Two patients took part in every trial, and all trials were conducted in the same room, containing two tables, each with two chairs with about 2 meters distance between the tables (mirroring a typical setting for the clown visit,

[2] Assignment of the role was made unobtrusively prior to each trial by the experimenter on the basis of randomization and a rule: Two chairs (A and B) were available in the room, for the two subjects who took part in the experiment at a time. The rule was that the subject in chair A was always the participant throughout the experiment, whereas the subject in chair B was always the observer. Both subjects waited in front of the experimental room, and were invited in by the experimenter simultaneously. Prior to the study, it was randomly decided for each trial, which chair would be assigned to the subject entering the room first.

e.g., a recreation room in the rehabilitation center). Patients were placed at the tables, both facing the door. It was highlighted that several questions regarding their current thoughts and feelings would be asked repeatedly, and they were asked to rate them each time according to their current state. After the experimenter explained the questionnaires to the patients, she left the room and all further instructions were given in written form.

First, subjects filled out the CLEM-29 and STCI-S (baseline assessment) and the HSEF-General to support the cover story. Once both subjects finished the first set of questionnaires, they gave an acoustical sign and the first intervention started (either clown or nurse, randomly decided). Subjects subsequently filled out the CLEM-29, HSEF-Current and STCI-S. Once both subjects finished the second set of questions, the second intervention was carried out, followed by the third set of questions (CLEM-29, HSEF-Current, STCI-S). At the end of the experiment, patients were debriefed about the real aim of the study (to investigate emotional reactions to hospital clowns and nurses) and were asked to give their consent again. All subjects agreed in written form not to disclose the use of clowns in the study to other patients until the study was completed. Finally, they were asked to fill out the HSEF-Preferences.

The interventions

Clowns and nurses were instructed only to involve the participating patient in the intervention. It was highlighted that the interventions should be carried out as standardized as possible, but also as realistic as possible, meaning that in case the observing subject made an attempt to communicate with the clown/nurse, they should not ignore them but react in a natural way before bringing the participant back into focus. Furthermore, they were instructed to restrict the stay in the room to a length of five to eight minutes.

The hospital clown intervention was a humorous intervention aimed at enhancing the patients' positive emotional state. The shortest intervention lasted 4.00 minutes, and the

longest 8.85 minutes, with a mean duration of 6.62 minutes (*SD* = 1.17). One clown pair (male clown aged 49, female clown aged 44; together 13 years of experience in hospitals and on stage) carried out all trials. Costumes and make up were held constant during all interventions. The male clown carried a ukulele, wore a Doctor-like jacket, and the red nose. The female clown wore a yellow dirndl dress with yellow socks, a pink blouse, and the red nose. She had an abnormally large handbag in one hand filled with requisites; e.g., a pig nose that makes a farting sound when squeezed, and a thimble, used to demonstrate a magic trick together. The clown pair behaved like Auguste and Whiteface: the male clown was the foolish, clumsy and more sensitive partner, while the female clown was more dominant, slightly aggressive, bossy and pompous.

The nurse intervention was a standardized routine assessment of patient's health status. Nine nurses (six female, M_{age} = 36.56, SD_{age} = 8.08) were utilized in the experiment, all of which were members of staff at the rehabilitation center at the time of the experiment, with a minimum work experience of two years, and a maximum of 28 years. Each nurse performed the nurse intervention with the help of the same standardized interview guide. It was developed with the help of a health professional experienced in nursing assessment, and contained 13 questions regarding the overall state of health, pain level, sleep quality, mobility, and an assessment of vital signs (temperature, blood pressure, pulse). The tool was created for the standardization of the assessment and the data was not used for analysis. All nurses wore their medical scrubs and used their standard hospital equipment. Beforehand, each nurse was trained in how to conduct the standardized assessment, and was given the opportunity to carry out one test intervention with the experimenter. The interventions lasted between 3.38 and 11.29 minutes, with a mean length of 7.34 minutes (*SD* = 2.29).

Results

Manipulation checks

Repeated measures ANOVAs with condition as repeated measurement factor were carried out to test whether the two interventions had the intended quality. The clown intervention was rated funnier than the nurse intervention, $F(1,40) = 27.27$, $p = .001$, subjects felt more cheerful afterwards, $F(1,41) = 5.00$, $p = .03$, and they felt a higher level of global positive feelings after the clown intervention than after the nurse intervention, $F(1,40) = 5.18$, $p = .03$. The two interventions did not differ in terms of liking, $F(1,38) = 1.04$, $p = .31$, or aversion, $F(1,38) = 0.33$, $p = .57$. As expected, ratings of negative emotions were very low after both interventions and did not differ between the two, indicating that most subjects did not experience negative emotions (e.g., global negative feelings after the intervention, $M_{clown} = 1.75$, $M_{nurse} = 2.00$; scale from 1-7). The two randomly assigned groups of participants and observers did not differ in their judgment of the funniness of clowns in general, $F(1, 39) = 3.42$, $p = .07$, the general liking of clowns, $F(1,39) = 3.29$, $p = .08$, and the general aversion towards clowns, $F(1,39) = 0.12$, $p = .73$. A check of whether the randomly assigned role (which was held constant throughout the experiment) converged with the perceived role during each intervention revealed that during the nurse intervention subjects perceived their role with high accuracy (only one wrong perception). During the clown intervention, the perceived role differed from the assigned role to a greater extent: 16.67% of assigned observers stated that they were actively involved in the clown intervention, whereas 47.62% of assigned participants stated that they were more in an observing role. The correlation between assigned and perceived role was $r = .89$ ($p < .001$) in the nurse condition, and $r = .33$ ($p < .05$) in the clown condition. Hence, in the following section results regarding the randomly assigned role should be interpreted with caution.

Data preparation for hypotheses testing

An inspection of the distribution of all single ratings of the CLEM-29 at three measurement points revealed that 27 out of 87 (31.03%) ratings were not normally

distributed (Skewness and Kurtosis below -2.00 or higher than 2.00). This was due to a floor effect of some ratings, especially the negative ones. To correct the distribution issues, to reduce the number of analyses, and to make the ratings more reliable, it was decided to conduct a principal component analysis (PCA) of the ratings from the hospital clown intervention. Since the sample size was too small to meaningfully conduct a PCA, ratings from the present study were merged with ratings from an earlier study using observers of clown and nurse interventions (Auerbach et al., 2014), and subjected to a PCA and rotated according to the Oblimin criterion. The first seven eigenvalues were 11.86, 3.80, 2.41, 1.91, 1.02, 0.83, and 0.67. The screeplot and a parallel analysis suggested the retention of four factors. The factor loadings, which together explained 68.89% of the variance, are displayed in Table 1. All factor scores were normally distributed. No significant correlations with age or gender were found for any of the factors.

Insert Table 1 about here

As displayed in Table 1, the ratings formed four factors. They were analogously to Auerbach et al. (2014) labeled *transcendence* (merging more inward feelings of privilege, elevation and appreciation and more active and outward feelings of liberation, feeling seduced and playful), *uneasiness* (threatened, fearful, creepy, confused), *amusement* (e.g., feelings of hilarity, exhilaration, surprise, curiosity), and *high vs. low arousal* (bipolar factor merging more calm feelings on the positive pole such as touched, speechless, and more aroused feelings on the negative pole such as overexcited, naughty, *schadenfreude*). Ratings on the bipolar factor showed second loadings on other factors, e.g., speechless loaded almost as high on uneasiness, and feeling touched loaded also on transcendence.

Effects of condition

To test the effect of the conditions, it was analyzed whether patients experienced different levels of transcendence, amusement, arousal, and uneasiness at the baseline and

after the clown and nurse interventions. Repeated measures ANOVAs with condition as repeated measurement factor were computed with the factor scores of the four CLEM-factors as dependent variables[3] (see Table 2).

Insert Table 2 about here

As displayed in Table 2, there was a significant effect for condition in the factors transcendence, amusement, and arousal, and no effect in the factor uneasiness. The level of amusement was higher after the hospital clown intervention than at baseline and the nurse intervention, with no difference between the latter two. Both interventions led to a raise in arousal compared to baseline. Interestingly, the level of transcendence was highest at baseline, and was lowered during both interventions with no significant difference between the clown and nurse intervention (with a numerical trend towards higher feelings of transcendence after the clown than after the nurse intervention).

Effects of role of subject

Next, we examined the emotional state of subjects as a function of their role during the two interventions. A manipulation check revealed that at baseline, no difference was found between participants and observers in their level of transcendence, $t(37) = .91$, $p = .37$, amusement, $t(37) = .30$, $p = .77$, arousal, $t(37) = -.52$, $p = .61$, and uneasiness, $t(37) = -.48$, $p = .63$. To test the hypotheses, four repeated measures ANOVA's were conducted with intervention (clown vs. nurse) as repeated measurement factor and role (participant vs. observer) as between-subjects factor (Table 3).

Insert Table 3 about here

As displayed in Table 3, none of the main effects for role, and no interactions were significant for any emotional dimension[4]. Hence, the role of subjects did not moderate the

[3] ANOVA's with presentation order as between variable (clown or nurse first) revealed the order of the interventions did not influence the results.

effect of type of intervention on the emotional state. As expected, there was a main effect for intervention in amusement with the clown intervention leading to a higher feeling of amusement than the nurse intervention.

Prediction of an overall evaluation of the clown intervention

Prior research with observers of clown interventions showed that in order to predict the total amount of positive affect of individuals while observing a clown visit, a combination of the "humor" and the "love"-aspect was required: the more people felt cheerful *and* associated with/touched by the clown, the higher their intensity of positive feelings was (Auerbach et al., 2014). To replicate and extend these results to patients in the hospital setting, we investigated the predictive value of the CLEM-29 dimensions for the total amount of positive affect experienced during the clown intervention while controlling for general preferences for clown performances. The bivariate correlations between the criterion (total amount of positive affect[5]) and the predictors were of small to moderate size (transcendence: $r = .45$, $p < .01$, unease: $r = -.14$, n.s., amusement: $r = .42$, $p < .01$, and arousal: $r = .19$, n.s, general funniness of clowns: $r = .60$, $p < .01$, aversion to clowns: $r = -.10$, n.s.). In a hierarchical multiple regression analysis (block 1, method enter: general funniness and aversion of clown performances, HSEF-Preferences); block 2, method stepwise: amusement, transcendence, arousal and uneasiness, CLEM-29), the total amount of positive feelings during the clown visit was best predicted ($R^2 = .50$ in the final model) by a combination of general funniness of clown performances ($\beta = .58$, $p < .001$) and felt transcendence ($\beta = .39$, $p < .01$; $\Delta R^2 = .14$)[6]. Transcendence added incremental validity to the prediction over and above funniness of clown performances in this sample of patients, supporting the idea that

[4] Although manipulation checks revealed that not all participants were aware of their assigned role, results were highly comparable when participants with incorrect role judgment were excluded.

[5] The criterion was: „Please rate you level of positive feelings that you experienced during the situation" (7-point Likert scale from „not at all positive" to „very strongly positive").

[6] The incremental validity of the factor of transcendence in predicting the global positive feelings towards the clown intervention was also high when including the current instead of general assessment of funniness and aversion of the clown performance.

both amusing and transcendent emotional states play a role in clarifying the effect of hospital clown on patients' positive emotional state.

Discussion

The present study investigates the effects of a hospital clown intervention compared to a nurse intervention on the emotional state of patients using a controlled experimental design in a natural hospital setting. Overall, the study shows that hospital clowns are indeed able to elicit a positive emotional state in individuals that are exposed to an adverse environment (here: hospitalized patients due to injuries or illness). We found changes in the expected direction with the hospital clowns eliciting a higher level of amusement than the nurse intervention and baseline assessment. The interventions also had the intended quality: Subjects liked both interventions equally and to a high extent, but the hospital clown intervention was perceived funnier than the nurse intervention. This is the first experimental study to demonstrate differences in the emotional state of patients as a function of two different kinds of interventions; hence, the reported difference can clearly be attributed to the hospital clown intervention. Furthermore, the interventions influenced the patient's emotional state independently of their active or passive role in the situation. This speaks in favor of the emotional contagion hypothesis (Hatfield et al., 1994), and highlights that hospital clown interventions have a positive effect on the level of amusement not only in the targeted person of the intervention, but also in people watching.

Unexpectedly, the level of transcendence was highest at baseline, and was lowered during both clown and nurse intervention. Tentatively interpreted, one could argue that the cover story and the recruiting method might have been influenced the level of transcendence at baseline. Many patients in the sample were paralyzed and have partially lost their autonomy. Being a valuable aid to the research might have given subjects a sense of meaning and worth. Nevertheless, a tendency towards a higher level of transcendence during the

clown intervention compared to the nurse intervention was observed (but not significant), which goes in the intended direction. Future research should utilize a larger sample size and a more neutral cover story to investigate the elicitation of transcendence in patients during an experiment.

The regression analysis showed that when looking only at the hospital clown intervention, both amusing and transcendent components played an important role in the prediction of the global judgment of the situation. The higher the combination of patients' funniness ratings of clown performances *and* their felt level of transcendent feelings during the intervention (i.e., privileged, appreciated, blessed and so on), the higher is the positive global evaluation of the clown intervention. This adds a new component to prior research inasmuch as patients' positive evaluations of clown visits are predicted by emotions going beyond the typical 'humor response'. This gives scientific support to implicit theories and assumptions of practitioners such as Patch Adams (2002), who feel that the clown's mission in hospitals is more than just to amuse and entertain patients in need of care. Presumably the positive feelings elicited by hospital clowns might broaden the scope of attention and perception, helping the patient to escape the daily hospital routine and focus on other aspects of life. This liberating effect of clowning has been described in the *liberation theory*: A humorous intervention frees people from accustomed concerns, conflicts, or modes of processing and provides 'release from our stabilizing systems, escape from our self-imposed prisons. Every instance of laughter is an instance of liberation from our controls' (Mindess, 2010, p. 23).

Limitations and outlook

The present research has some limitations. First, experimenter and recruiter were not blind to the aims of the study, which might have influenced their behavior towards the subjects. However, we tried to minimize possible effects through a high level of

standardization and no contact between the experimenters and subjects during the trials. Second, the used cover story and recruiting method might have affected the level of transcendence at baseline assessment. Future studies should replicate the findings with a more "neutral" cover story. Third, more than one nurse was used to operationalize the nurse intervention. This was due to organizational reasons in the hospital and could not be avoided. Future experiments should focus on matching the two interventions using same clown pair and nurse. Fourth, the assignment of roles was only partly successful. A reason for the incongruity between perceived role and assigned role during the clown visit might be that the two clowns did not involve only the participants as clearly in the activity as the nurse did. Some patients were acquainted with the clowns from prior clown visits, and started an interaction right away (although unknowingly being in the role of the observer). However, an analysis excluding all misperceiving subjects did not change any results, which speaks in favor of the contagious effect of the clown intervention. Last, the present study included only self-reported ratings of emotional states in the analysis. Future experiments should validate the results through objective measures of emotional states (e.g., the facial display of amusement). Another point to consider is that humor research showed that the reaction of an individual to a humorous stimulus is related to the kind of stimulus presented (e.g., Ruch & Rath, 1993). In the present study it was decided to use the same clown pair in all trials to control for the effect of the different features of different humorous stimuli. As a result, findings cannot be generalized to other forms of clowning interventions.

Nevertheless, the study gives a first impression of the nature of positive emotional states elicited in individuals during a clown visit compared to a nurse intervention. What clowns working in the field have implicitly known since 1986 (with Michael Christensen laying the foundation stone for the professional hospital clown work in the USA), has now been experimentally verified: Hospital clowns add a unique quality of intervention to the

hospital routine and thereby succeed in eliciting a positive emotional state in patients. The results clearly support the implementation of clown visits as a strategy to promote positive feelings in patients in need of care, and hopefully to contribute to more health and well-being in the long run. As was already suggested by experienced clowns working in the field (Dionigi et al., 2012), clown organizations that train clowns to work in care facilities should encourage their clowns to incorporate components of attachment and empathy into their humor-based skills.

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Table 1

Pattern matrix of a joint principal component analysis of CLEM-29 ratings

	Transcendence	Uneasiness	Amusement	Arousal
Privileged	**.92**	.06	-.14	.11
Rise	**.86**	.12	-.06	-.03
Elevated	**.84**	.03	-.11	-.11
Blessed	**.84**	-.04	-.06	.06
Appreciated	**.77**	-.12	.15	.14
Took	**.76**	-.01	.13	.15
Seduced	**.75**	.03	-.06	-.27
Flirty	**.72**	.05	-.04	-.43
Freed	**.68**	-.10	.24	-.06
Associated	**.66**	-.04	.15	.31
Active	**.50**	-.07	.29	-.02
Imaginative	**.50**	.02	.36	-.33
Playful	**.47**	-.02	.35	-.45
Threatened	.03	**.85**	-.12	-.06
Fearful	.02	**.83**	-.10	.07
Creepy	.00	**.80**	-.17	-.11
Confused	-.20	**.71**	.20	-.11
Laughter	-.19	-.10	**.92**	-.09
Hilarity	.05	-.12	**.87**	-.14
Surprised	-.02	.27	**.81**	.14
Exhilarated	.14	-.16	**.78**	-.09
Puzzled	.21	.42	**.53**	.10
Impressed	.44	.05	**.51**	.31
Curious	.41	.05	**.49**	.00
Overexcited	.12	.28	.27	**-.66**
Naughty	.32	.13	.30	**-.57**
Touched	.55	-.05	.19	**.56**
Schadenfreude	-.02	.38	.16	**-.55**
Speechless	.24	.46	.24	**.46**

Note. $N = 403$. Extraction: Principal component analysis. Rotation: Oblimin. Boldface indicates highest factor loadings in a row. Rise = rise above yourself; Took = took something away from it; Laughter = burst into laughter; Associated = associated with the clown.

Table 2

Descriptive statistics and results of ANOVA at baseline, after clown and nurse condition

	Baseline		Clown		Nurse		ANOVA	
Factor	*M*	*SD*	*M*	*SD*	*M*	*SD*	*F*(2,68)	η^2
Transcendence	0.09_a	0.64	-0.31_b	0.65	-0.48_b	0.66	17.52**	.34
Uneasiness	-0.54	0.76	-0.38	0.88	-0.56	0.73	1.00	-
Arousal	0.30_b	0.70	0.68_a	0.72	0.68_a	0.56	5.85*	.15
Amusement	-0.27_b	0.93	0.96_a	1.41	-0.60_b	0.87	35.88**	.51

Note. $N = 35$. *M* = mean, *SD* = standard deviation. η^2 = partial η^2. Presented factor scores were estimated using the regression method.
Subscripts $_{a, b, c}$ indicate significant results of pairwise comparisons (Bonferroni-corrected), where $_a > _b > _c$.
*$p < .01$. **$p < .001$.

Table 3

Results of 2 (condition) x 2 (role) repeated measures ANOVAs

	F(1,33)	η^2
Transcendence		
Condition	2.76	-
Role	0.28	-
Condition x Role	1.90	-
Uneasiness		
Condition	1.72	-
Role	0.17	-
Condition x Role	0.19	-
Amusement		
Condition	46.39*	.58
Role	0.56	-
Condition x Role	0.53	-
Arousal		
Condition	0.00	-
Role	0.56	-
Condition x Role	0.00	-

Note. $N = 35$. η^2 = partial η^2.
*$p < .001$.